

AMENDMENT UNDER 37 C.F.R. § 1.116
U.S. Patent Application No. 09/869,967

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A steel cord for the reinforcement of a rubber article comprising:

a core strand formed by twisting a plurality of filaments, and
a plurality of sheath strands arranged around the core strand and each formed by twisting a plurality of filaments,

~~characterized in that wherein~~ each of the sheath strands is formed by twisting ~~one or more outer and inner~~ sheath layers made of plural filaments around a core made of ~~one or more filaments at least one filament~~, [[and]] all of the filaments constituting each sheath layer of each sheath strand have the same diameter, ~~a diameter of the filaments of the outer sheath layer of each sheath strand is larger than a diameter of the filaments of the inner sheath layer located inside the outer sheath layer~~, and a diameter of the filaments ~~constituting an outermost of the inner~~ sheath layer of each sheath strand is larger than a diameter of ~~every filament constituting every layer the at least one filament of the core located inside the outermost inner~~ sheath layer.

2. (Currently Amended) A steel cord for the reinforcement of a rubber article comprising:

a core strand formed by twisting a plurality of filaments, and

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a plurality of sheath strands arranged around the core strand and each formed by twisting a plurality of filaments,

~~characterized in that~~ wherein the core strand is formed by twisting ~~one or two~~ outer and inner sheath layers made of plural filaments around a core made of three filaments, [[and]] all of the filaments constituting each sheath layer of the core strand have the same diameter, and a diameter of every filament constituting ~~an outermost~~ the outer sheath layer of the core strand is larger than a diameter of every filament constituting every the inner sheath layer located inside the outer sheath layer and a diameter of every filament constituting the core located inside the ~~outermost~~ inner sheath layer.

3. (Canceled)

4. (Currently Amended) A steel cord for the reinforcement of a rubber article according to claim 2, wherein ~~the core strand has two sheath layers and~~ a ratio of total sectional area of all filaments constituting the core strand to area of a circumcircle formed by filaments constituting ~~an outermost~~ the outer sheath layer is not less than 0.730.

5. (Currently Amended) A steel cord for the reinforcement of a rubber article comprising:

a core strand formed by twisting a plurality of filaments, and

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a plurality of sheath strands arranged around the core strand and each formed by twisting a plurality of filaments,

~~characterized in that~~ wherein each of the core strand and the sheath strand is formed by twisting ~~one or two~~ outer and inner sheath layers made of plural filaments around a core made of three filaments, [[and]] all of the filaments constituting each sheath layer of each of the core strand and the sheath strands have the same diameter, and a diameter of every filament constituting ~~an outermost~~ the outer sheath layer of each of the core strand and the sheath strands is larger than a diameter of every filament constituting every the inner sheath layer located inside the outer sheath layer and a diameter of every filament constituting the core located inside the outermost inner sheath layer.

6. (Canceled)

7. (Currently Amended) A steel cord for the reinforcement of a rubber article according to claim 5, wherein for each strand, has two sheath layers and a ratio of total sectional area of all filaments constituting the strand to area of a circumcircle formed by filaments constituting an outermost sheath layer is not less than 0.730.

8. (Previously Presented) A steel cord for the reinforcement of a rubber article according to claim 2, wherein a distance between mutual steel filaments in each layer of each strand is not more than 0.014 mm.

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9. (Previously Presented) A steel cord for the reinforcement of a rubber article comprising:

a core strand formed by twisting a plurality of filaments, and

a plurality of sheath strands arranged around the core strand and each formed by twisting a plurality of filaments,

characterized in that each of the sheath strands is formed by twisting two sheath layers made of plural filaments around a core made of one or more filaments, and all of the filaments constituting each sheath layer of each sheath strand have the same diameter and a diameter of every filament constituting an outermost sheath layer of each sheath strand is larger than a diameter of every filament constituting every layer located inside the outermost sheath layer, and when a diameter of a filament constituting an outermost sheath layer in the sheath strand is ϕ_s (mm) and a diameter of a circumcircle inscribing all filaments in the outermost sheath layer is Φ (mm), they satisfy a relation of $0.55 \leq \Phi/6.14\phi_s \leq 0.90$, and when a diameter of a filament constituting an outermost sheath layer in the core strand is ϕ_c (mm), it satisfies a relation of $\phi_s \leq \phi_c$.

10. (Original) A steel cord for the reinforcement of a rubber article according to claim 9, wherein all filaments other than filaments constituting the outermost sheath layer in the sheath strands has the same diameter.

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11. (Original) A steel cord for the reinforcement of a rubber article according to claim 9, wherein all filaments other than filaments constituting the core in the sheath strands have the same diameter.

12. (Original) A steel cord for the reinforcement of a rubber article according to claim 9, wherein all filaments other than filaments constituting an outermost sheath layer in the core strand have the same diameter.

13. (Original) A steel cord for the reinforcement of a rubber article according to claim 9, wherein all diameter other than filaments constituting the core in the core stand have the same diameter.

14. (Original) A steel cord for the reinforcement of a rubber article according to claim 9, wherein all filaments constituting the core strand have the same diameter.

15. (Original) A steel cord for the reinforcement of a rubber article according to claim 9, wherein filaments constituting the outermost sheath layer in the sheath strand have a diameter of 0.20-0.50 mm.

16. (Original) A steel cord for the reinforcement of a rubber article according to claim 9, wherein the filaments have a tensile strength of not less than 3000 MPa.

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17. (Previously Presented): A steel cord for the reinforcement of a rubber article according to claim 9, wherein the cord has a cord construction formed by arranging six sheath strands around one core strand, each of these sheath strands has a construction formed by arranging two sheath layers made of plural filaments around a core made of three filaments.

18. (Original) A steel cord for the reinforcement of a rubber article according to claim 9, wherein a twisting direction of the outermost sheath layer in the sheath strand is the same as that of the sheath strand.

19. (Original) A steel cord for the reinforcement of a rubber article according to claim 9, wherein the cord has a wrapping filament helically wound along an outer periphery of the cord.

20. (Currently Amended) A tire comprising a carcass toroidally extending between a pair of bead portions as a skeleton and a belt disposed on an outside of the carcass in a radial direction and comprised of plural belt layers, and steel cords applied to at least one of the carcass and the belt layers,

wherein the steel cords comprise a core strand and a plurality of sheath strands, each formed by twisting a plurality of filaments, wherein each of the core strand and the sheath strands is formed by twisting ~~one or more~~ outer and inner sheath layers made of plural filaments around a core made of ~~one or more~~ filaments at least one filament, [[and]] all of the filaments

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constituting each sheath layer of each of the core strand and the sheath strands have the same diameter, [[and]] a diameter of every filament ~~constituting an outermost of the outer~~ sheath layer of each of the core strand and the sheath strands is larger than a diameter of every filament ~~constituting every of the inner sheath~~ layer located inside the ~~outermost outer~~ sheath layer, and a diameter of every filament of the inner sheath layer of each of the core strand and the sheath strands is larger than a diameter of the at least one filament of the core located inside the inner sheath layer.

21. (Previously Presented) A steel cord for the reinforcement of a rubber article according to claim 5, wherein a distance between mutual steel filaments in each layer of the strand is not more than 0.014 mm.

22. (Currently Amended) A steel cord for the reinforcement of a rubber article comprising:

a core strand formed by twisting a plurality of filaments; and
a plurality of sheath strands arranged around the core strand and each formed by twisting a plurality of filaments;

wherein the core strand is formed by twisting ~~one or two~~ a sheath ~~layers~~ layer made of plural filaments around a core made of three filaments, and all of the filaments constituting each the sheath layer of the core strand have the same diameter, which is larger than a diameter of the filaments constituting ~~a layer located inside the sheath layer~~ the core of the core strand, and

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wherein ~~the core strand has one sheath layer and~~ a ratio of total sectional area of all filaments constituting the core strand to area of a circumcircle formed by filaments constituting the sheath layer is not less than 0.715.

23. (Currently Amended) A steel cord for the reinforcement of a rubber article comprising:

a core strand formed by twisting a plurality of filaments; and
a plurality of sheath strands arranged around the core strand and each formed by twisting a plurality of filaments,

wherein the core strand is formed by twisting ~~one or~~ two sheath layers made of plural filaments around a core made of three filaments, [[and]] all of the filaments constituting each sheath layer of the core strand have the same diameter, which and a diameter of every filament constituting an outermost sheath layer of the core strand is larger than a diameter of the filaments every filament constituting a layer located inside the sheath layer the core of the core strand, and

wherein ~~the core strand has two sheath layers and~~ a ratio of total sectional area of all filaments constituting the core strand to area of a circumcircle formed by filaments constituting [[an]] the outermost sheath layer is not less than 0.730.

24. (Currently Amended) A steel cord for the reinforcement of a rubber article comprising:

a core strand formed by twisting a plurality of filaments; and

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a plurality of sheath strands arranged around the core strand and each formed by twisting a plurality of filaments,

wherein each of the core strand and the sheath ~~strand~~ strands is formed by twisting ~~one or two~~ a sheath ~~layers~~ layer made of plural filaments around a core made of three filaments, [[and]] all of the filaments constituting [[each]] the sheath layer of each of the core strand and the sheath strands have a diameter larger than that ~~of the~~ every filament constituting ~~a~~ layer located inside the sheath layer the core of each of the core strand and the sheath strands, and

wherein for each strand, ~~has one sheath layer and~~ a ratio of total sectional area of all filaments constituting the strand to area of a circumcircle formed by filaments constituting the sheath layer is not less than 0.715.

25. (Currently Amended) A steel cord for the reinforcement of a rubber article comprising:

a core strand formed by twisting a plurality of filaments; and

a plurality of sheath strands arranged around the core strand and each formed by twisting a plurality of filaments,

wherein each of the core strand and the sheath ~~strand~~ strands is formed by twisting ~~one or two~~ a sheath layers made of plural filaments around a core made of three filaments, [[and]] all of the filaments constituting each sheath layer of each of the core strand and the sheath strands have [[a]] the same diameter, and a diameter of every filament constituting an outermost sheath layer of each of the core strand and the sheath strands is larger than ~~that of the~~ a diameter of every

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filament constituting a layer located inside the sheath layer the core of each of the core strand and the sheath strands, and

wherein for each strand, ~~has two sheath layers and~~ a ratio of total sectional area of all filaments constituting the strand to area of a circumcircle formed by filaments constituting [[an]] the outermost sheath layer is not less than 0.730.

26. (Currently Amended) A steel cord for the reinforcement of a rubber article comprising:

a core strand formed by twisting a plurality of filaments; and

a plurality of sheath strands arranged around the core strand and each formed by twisting a plurality of filaments,

wherein the core strand is formed by twisting one or two sheath layers made of plural filaments around a core made of three filaments, [[and]] all of the filaments constituting each sheath layer of the core strand have the same diameter, which is and a diameter of every filament constituting an outermost sheath layer of the core strand is larger than a diameter of the filaments every filament constituting a layer located inside the sheath layer the core of the core strand, and

wherein a distance between mutual steel filaments in each layer of each strand is not more than 0.014 mm.

27. (Previously Presented) A steel cord for the reinforcement of a rubber article comprising:

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a core strand formed by twisting a plurality of filaments; and
a plurality of sheath strands arranged around the core strand and each formed by twisting
a plurality of filaments,
wherein the sheath strands are formed by twisting two sheath layers each made of plural
filaments around a core made of three filaments, all of the filaments constituting an outermost
sheath layer of each sheath strand have the same diameter, and when a diameter of a filament
constituting an outermost sheath layer in the sheath strands is ϕ_s (mm) and a diameter of a
circumcircle inscribing all filaments in the outermost sheath layer is Φ (mm), they satisfy a
relation of $0.55 \leq \Phi/6.14\phi_s \leq 0.90$, and when a diameter of a filament constituting an outermost
sheath layer in the core strand is ϕ_c (mm), it satisfies a relation of $\phi_s \leq \phi_c$, wherein all filaments
other than filaments constituting the outermost sheath layer in the sheath strands has the same
diameter.

28. (Previously Presented) A steel cord for the reinforcement of a rubber article
comprising:

a core strand formed by twisting a plurality of filaments; and
a plurality of sheath strands arranged around the core strand and each formed by twisting
a plurality of filaments,
wherein the sheath strands are formed by twisting two sheath layers each made of plural
filaments around a core made of three filaments, all of the filaments constituting an outermost
sheath layer of each sheath strand have the same diameter, and when a diameter of a filament

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constituting an outermost sheath layer in the sheath strands is ϕ_s (mm) and a diameter of a circumcircle inscribing all filaments in the outermost sheath layer is Φ (mm), they satisfy a relation of $0.55 \leq \Phi/6.14\phi_s \leq 0.90$, and when a diameter of a filament constituting an outermost sheath layer in the core strand is ϕ_c (mm), it satisfies a relation of $\phi_s \leq \phi_c$, wherein all filaments other than filaments constituting the core in the sheath strands have the same diameter.

29. (Previously Presented) A steel cord for the reinforcement of a rubber article comprising:

a core strand formed by twisting a plurality of filaments; and
a plurality of sheath strands arranged around the core strand and each formed by twisting a plurality of filaments,

wherein the sheath strands are formed by twisting two sheath layers each made of plural filaments around a core made of three filaments, all of the filaments constituting an outermost sheath layer of each sheath strand have the same diameter, and when a diameter of a filament constituting an outermost sheath layer in the sheath strands is ϕ_s (mm) and a diameter of a circumcircle inscribing all filaments in the outermost sheath layer is Φ (mm), they satisfy a relation of $0.55 \leq \Phi/6.14\phi_s \leq 0.90$, and when a diameter of a filament constituting an outermost sheath layer in the core strand is ϕ_c (mm), it satisfies a relation of $\phi_s \leq \phi_c$, wherein all filaments other than filaments constituting an outermost sheath layer in the core strand have the same diameter.

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30. (Previously Presented) A steel cord for the reinforcement of a rubber article comprising:

a core strand formed by twisting a plurality of filaments; and

a plurality of sheath strands arranged around the core strand and each formed by twisting a plurality of filaments,

wherein the sheath strands are formed by twisting two sheath layers each made of plural filaments around a core made of three filaments, all of the filaments constituting an outermost sheath layer of each sheath strand have the same diameter, and when a diameter of a filament constituting an outermost sheath layer in the sheath strands is ϕ_s (mm) and a diameter of a circumcircle inscribing all filaments in the outermost sheath layer is Φ (mm), they satisfy a relation of $0.55 \leq \Phi/6.14\phi_s \leq 0.90$, and when a diameter of a filament constituting an outermost sheath layer in the core strand is ϕ_c (mm), it satisfies a relation of $\phi_s \leq \phi_c$, wherein all diameter other than filaments constituting the core in the core stand have the same diameter.

31. (Previously Presented) A steel cord for the reinforcement of a rubber article comprising:

a core strand formed by twisting a plurality of filaments; and

a plurality of sheath strands arranged around the core strand and each formed by twisting a plurality of filaments,

wherein the sheath strands are formed by twisting two sheath layers each made of plural filaments around a core made of three filaments, all of the filaments constituting an outermost

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sheath layer of each sheath strand have the same diameter, and when a diameter of a filament constituting an outermost sheath layer in the sheath strands is ϕ_s (mm) and a diameter of a circumcircle inscribing all filaments in the outermost sheath layer is Φ (mm), they satisfy a relation of $0.55 \leq \Phi/6.14\phi_s \leq 0.90$, and when a diameter of a filament constituting an outermost sheath layer in the core strand is ϕ_c (mm), it satisfies a relation of $\phi_s \leq \phi_c$, wherein all filaments constituting the core strand have the same diameter.

32. (Currently Amended) A steel cord for the reinforcement of a rubber article comprising:

a core strand formed by twisting a plurality of filaments; and

a plurality of sheath strands arranged around the core strand and each formed by twisting a plurality of filaments,

wherein each of the core strand and the sheath ~~strand~~ strands is formed by twisting one or two sheath layers made of plural filaments around a core made of three filaments, [[and]] all of the filaments constituting each sheath layer ~~have a diameter of each of the core strand and the sheath strands have the same diameter, and a diameter of every filament constituting an outermost sheath layer of each of the core strand and the sheaths strands is larger than that of the a diameter of every filament constituting a layer located inside the sheath layer the core of each of the core strand and the sheath strands, and~~

wherein a distance between mutual steel filaments in each layer of the strand is not more than 0.014 mm.